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C-A OPERATIONS PROCEDURES MANUAL

15.3.3.5 Procedure on What to Do if Main Magnet Ground Faults During Operations

(Booster/AGS Ring Power Supply Systems Group Procedure EPS-S-005)

Note: This document was formerly a C-A Group Procedure. The content of the group procedure was reviewed by the Technical Supervisor. All approvals and/or issue dates of the original group procedure are maintained for present use.

Text Pages 3 through 4

Hand Processed Changes

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Approved: _____ Signature on File _____
 Collider-Accelerator Department Chairman Date

M. Bannon

Group Procedure EPS-S-005
Revision 00

Siemens MMPS Main Magnet Ground faults During Operations

1.0 Purpose:

- 1.1 This procedure is to enable the Siemens MMPS operator to determine the location of the ground fault in the MMPS system and correct the situation.

2.0 Prerequisites

- 2.1 At least two people shall check for the ground fault. One operator and the other personnel who can assist in this task including a MCR or CAS operator, cognizant engineers and power supply group engineers and technicians.

3.0 Fault Indication & Notification

- 3.1 While the MMPS is in operations a ground fault will cause the system to trip on a PL4 level, which trips pulsing (rectifiers) and excitation (generator exciter) thus tripping 52G and the excitation CB-43 and the fast and slow 95 switches closing .
 - 3.1.1 The light on the main console LE1 #418 will indicate a ground fault.
- 3.2 Notify MCR of the occurrence and report that the fault is under investigation. Notify the system group leader and system engineer of the fault so they can get involved in troubleshoot were the ground may be located.
- 3.3 Verify the fast and slow 95 switches have closed.
- 3.4 Verify that CB-52 G has opened. Remove key from CB-52G so rectifier doors can be opened.
- 3.5 Verify excitation of generator is removed.(CB-43 exciter is open)

4.0 Visual Investigation For Water Leaks

- 4.1 Check Rectifier area for signs of water leak.
- 4.2 Check behind fence area and under the rectifier room floor for water leaks.
- 4.3 Check the inductor house 1 and 2 for water leaks.
- 4.4 Check the bus trench from inductor houses to Bldg 928 basement Area for water leaks.
- 4.5 Check the basement of Bldg. 928 above cap bank and 242 area for water leaks.
- 4.6 Check with the pump room if they got a alarm for make-up water for AGS Ring Magnet system.

- 4.7 Check ring humidity.
- 4.8 If no water leaks have been discovered it will be necessary to Hipot the AGS Ring to try to determine if ground is in the magnets or is it the rectifier system.

5.0 Hipot The AGS Main Magnets

- 5.1 Refer to AGS Hipot procedure (EPS-S-006)
- 5.2 When it is established what half of the ring the ground is on it will be necessary to enter the ring and start to keep breaking the ring in half then in half again the half again until you narrow the fault to one magnet. Document where bus is disconnected to isolate ground so when it comes time to reinstall everything back to normal, everything that was disconnected in search of the ground is put back together.
- 5.3 Once the fault is narrowed down do a determination of the extent of the repair that will be required.
- 5.4 If the magnet is to be removed and the bad coil replaced , refer to AGS MM rebuild procedure. (EPS-A-003) This will involve many groups therefore this job will need to be planned and coordinated with the AGS maintenance coordinator and the following groups (MCR,Vacuum, Pump Rm., Beam Components, Radiation Controls Group, RF Group & Siemens Power Rm.)
- 5.5 If there was no ground found then the ground is from the 95 switches to the rectifiers which includes the bus work from the 95 switches in basement, the cap bank area, the inductors 1 & 2 , the free wheelers 1 & 2 and the 8 rectifier modules.
- 5.6 Therefore it will be necessary to megger from the 95 switches back towards the rectifiers and try to isolate ground fault to one of the components mentioned in step 5.5.

6.0 Restore System After Ground Is Located And Repaired

- 6.1 After the ground is located and repaired reconnect and torque everything that was disconnected and retest system to assure that all grounds have been cleared.